The New Steel?

Enabling the Carbon Nanomaterials Revolution: Markets, Metrology, Safety, and Scale-up

Center for Nanoscale Science and Technology
National Institute of Standards and Technology, Gaithersburg, MD

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Adding nanostructured forms of carbon to many host materials can dramatically enhance the resulting composite mechanical, thermal, and electronic properties. While this potential has been recognized for some time, the commercial development of carbon nanomaterial composites has been slow. Among the reasons for this delay, the most significant are: 1) technical challenges in the cost-effective manufacture and quality control of the raw nanomaterial; 2) difficulties in integrating carbon nanomaterials effectively into composites; and 3) uncertainty over potential environmental health and safety (EH&S) and associated regulatory issues. This two-day workshop is being held under the auspices of the National Nanotechnology Initiative (NNI) Signature Initiative on Sustainable Nanomanufacturing, and will support NIST's broad-based effort to identify technical challenges to the commercial development of high-performance, carbon-based nanomaterials. The workshop will focus on the following areas:

- Carbon nanomaterial manufacture
- Quality control/certification of carbon nanomaterials (raw material and finished products)
- Integration of carbon nanostructures into products
- Manufacturing scale-up
- Life cycle
- EH&S

The workshop is expected to attract participants primarily from industry, with representatives from both the material manufacturing and end-user communities. It will provide an opportunity for the attendees to network with internationally recognized experts, discuss and prioritize technical barriers to the emerging carbon nanocomposite industry, identify and discuss future material and process measurement capabilities, and gain new perspectives on the trends, drivers, and challenges in this field. The results of the workshop will help guide future investments in measurement and science to advance the manufacturability of carbon-based nanocomposites.

The goal of the workshop is to identify the potential technical barriers and associated knowledge gaps that stand in the way of solutions, with an emphasis on identifying current and future measurement capabilities that can fill those gaps. The workshop will feature special sessions on EH&S and on the effective use of industry consortia and working groups to accelerate technology development, with examples drawn from the semiconductor and energy sectors.

World experts in each of these areas will meet to present the current status and challenges that these technologies face in the future. Breakout sessions will be used to discuss these challenges and identify the most promising paths to solutions. The planned workshop report will delineate strategies to accelerate the widespread deployment of carbon nanomaterials.

For more information: e-mail TheNewSteel@nist.gov

CNST Center for Nanoscale Science & Technology

NIST National Institute of Standards and Technology U.S. Department of Commerce